REMARKS

Applicant thanks the Examiner for a thorough examination of the present application, but respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 5 and 15 were previously canceled. Claims 3, 4, 13, and 14 are currently being canceled. Claims 1 and 11 are currently being amended. After amending the claims as set forth above, claims 1-3, 6-13, and 16-20 are now pending in this application.

In the outstanding Office Action, claims 1-4, 6-14, and 16-20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,871,934 to Masuyama et al. (Masuyama) in view of U.S. Patent No. 6,238,112 to Girones et al. (Girones).[1] Applicant respectfully traverses this rejection for at least the reasons set forth below.

As an initial matter, Applicant notes that the Examiner stated:

> The limitation "wherein each element newly made available to the group is initially made available for use less frequently than the existing element(s)" as broadly interpreted, merely calls for elements newly made available for printing to be used less frequently than the existing elements, which is necessarily true for any nozzle that is newly introduced whose frequency of use so far is comparatively less than that of the nozzles that has already been in use. Applicant's remark on Page 9 is ambiguous in so far that it does not specified the difference between applicant's claimed invention and the prior art of record. (Page 4 of Office Action).

Although Applicant does not agree with the Examiner's position that this claim element is ambiguous and may be interpreted in the manner discussed above, in a good faith effort to advance prosecution, Applicant has amended claims 1 and 11 to indicate that the claimed availability frequency is with regard to "a subsequent pass of printing." As such, Applicant respectfully submits that the amended claim element cannot be considered to relate to the "frequency used so far." If the Examiner has further questions concerning this issue, or thinks

[1] Applicant notes that the Office Action mistakenly recites "Maruyama et al." instead of "Masuyama et al."

that this amendment fails to clarify any possible ambiguity, Applicant respectfully requests the Examiner to contact the undersigned at the Examiner's earliest convenience.

In the outstanding Office Action, the Examiner asserted that Masuyama disclosed all of the claimed features except for making each element newly made available to the group available for use less frequently than the existing elements in a subsequent pass of printing. The Examiner asserted that Girones cured this deficiency. Applicant respectfully disagrees with the Examiner's position and submits that neither Girones nor Masuyama teaches or suggest making each element newly made available to the group available for use less frequently than the existing elements in a subsequent pass of printing.

As correctly recognized by the Examiner, "Masuyama does not teach wherein each element newly made available to the group is initially assigned a frequency of firing inks that is lesser than an existing frequency of firing inks assigned to the existing elements, in at least a subsequent pass of printing employing both the newly made available element and the existing elements." (*See*, page 4 of Office Action). Thus, since the Examiner has recognized this point, and since Applicant has explained this point in detail in the previous response, Applicant will not cumulatively re-analyze Masuyama, and will instead incorporate its previous arguments by reference and focus on Girones.

Applicant respectfully submits that Girones fails to teach or suggest that "each element newly made available to the group is initially made available for use less frequently than the existing element(s) in a subsequent pass of printing," as recited in claim 1 and similarly recited in claim 11. Girones generally discusses a method of *compensating* for malfunctioning inkjet nozzles, wherein the method assigns a probability of operating properly to each ink jet, and the ink jets with higher probabilities of working properly replace ink jets with lower probabilities of operating proper. (*See, e.g.*, Abstract and col. 3, lines 31-67). However, nowhere in Girones is there a discussion related to using newly introduced elements less frequently. In rejecting this claim feature, the Examiner cited "Col. 27, Table 7, initial printmask, Col. 28, Table 9, updated printmask, and see Col. 27-28, the process for designing a updated printmask, the lower

frequency of firing being zero." (*See*, page 6 of Office Action). As discussed in greater detail below, Applicant has thoroughly examined the cited sections of Girones, and respectfully submits that none of these cited sections correspond to the above-discussed claim element of the present application.

Column 27 of Girones begins by discussing a print head with "four nozzles only." As shown in Table 7, the four nozzles {1, 2, 3, 4} conduct four passes, wherein "all nozzles fire" on the first dot in the first pass, second dot in the second pass, third dot in the third pass, and so on. As further discussed, a probability of functioning properly is calculated for each of the four nozzles. (*See*, col. 27, lines 34-37). As illustrated in Figure 18, and as discussed in column 27, lines 42-67, various algorithms are used to determine which nozzles have the highest probability of failing. For example, at column 28, lines 20-22, Girones states that "[t]he result is that the two nozzles N0 and N1 having the higher probability of failing has been correctly replaced by the ones having the higher probability of working." Thus, in this example, nozzles N0 and N1 are determined to have a high probability of failing. As such, Girones teaches that N2 and N3 must *compensate* for losing N0 and N1. This compensation is depicted in Table 9, wherein nozzles N2 and N3 are the *only* nozzles used to fire dots 1-4 in passes 1-4. Therefore, in order to properly cover dots 1-4, nozzles N2 and N3 must each fire a total of 8 times, whereas nozzles N0 and N1 no longer fire at all. In other words, nozzles N2 and N3 have to double their frequency to compensate for losing nozzles N0 and N1.

Accordingly, Girones relates to the concept of making reliable nozzles *compensate* for unreliable nozzles by firing more often. Applicant respectfully submits that making existing reliable nozzles compensate for the removed nozzles is not the same as using newly introduced elements less frequently in subsequent passes of printing than the existing elements. Accordingly, both Masuyama and Girones are deficient with respect to this claim element previously presented in Applicant's claim listing.

Nevertheless, in a good faith effort to advance prosecution, Applicant has further amended independent claims 1 and 11 to include the features previously presented in claims 4

and 14. As such, claim 1 recites that "the number of elements in the group available to print is increased as a function of the number of firing pulses sent to the elements of the group." In addition, claim 11 now recites that "the number of elements in the subset of that group is increased in dependence upon the cumulative number of firing pulses sent to the elements of the group during the printing of the printjob." Applicant respectfully submits that neither Masuyama nor Girones teaches or even hints at these claim elements.

In the rejection of previously presented claims 4 and 14 (now incorporated into claims 1 and 11), the Examiner cited col. 5, lines 1-10 of Maruyama and col. 14, lines 14-16 of Girones. (*See*, pages 7 and 12 of Office Action). Applicant has analyzed these cite portions of text in detail, as well as the rest of the reference, and submits that neither reference discloses the claim element. At col. 5, lines 1-10, Maruyama states:

> The direction of nozzle arrays, when the print head is mounted on the carriage, is parallel to the sub-scan direction. A heater is provided for each nozzle and is energized to heat the ink in the nozzle near a nozzle opening to generate a bubble in the ink. An ink droplet of a predetermined volume is expelled from the nozzle by a pressure of the bubble as it grows. This printing technique employed in this embodiment is called a bubble-through system. Other ink jet printing methods may also be used.

Accordingly, the cited portion of Maruyama merely states that a heater is used to energize a nozzle to generate a bubble of ink and thereby expel ink. Applicant respectfully submits that such a discussion has no correlation whatsoever to increasing the elements in the group available to print as a *function of the number of firing pulses*.

With regard to the Examiner's reliance on col. 14, lines 14-16 of Girones, this portion of text merely states that "[i]t will be appreciated that the print head is controlled by a series of signals generated by a print head driver device." Similar to above, Applicant respectfully submits that such a discussion has no correlation whatsoever to increasing the elements in the group available to print as a *function of the number of firing pulses*.

Accordingly, for at least the reasons discussed in great detail above, Applicant respectfully submits that neither Masuyama nor Girones teaches or suggests all of the features required by independent claims 1 and 11. Because none of the references cited by the Examiner, either separately or in combination with each other, teaches or suggests all of the features recited in independent claims 1 and 11, Applicant submits that independent claims 1 and 11 are patentable over these cited references. Furthermore, because dependent claims 2, 3, 6-10, 12, 13, and 16-20 are each directly or indirectly dependent upon independent claims 1 and 11, Applicant submits that each of these claims are allowable for at least the same reasons discussed above, in addition to their own reasons which Applicant reserves the right to argue at a later time if necessary.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 08-2025. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 08-2025. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 08-2025.

Respectfully submitted,

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